

EXHIBIT 21

**IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF TEXAS
MARSHALL DIVISION**

TQ DELTA, LLC,

Plaintiff,

v.

**COMMSCOPE HOLDING COMPANY, INC.,
COMMSCOPE INC., ARRIS US HOLDINGS,
INC., ARRIS SOLUTIONS, INC., ARRIS
TECHNOLOGY, INC., and ARRIS
ENTERPRISES, LLC**

Defendants.

CIV. A. NO. 2:21-CV-310-JRG
(Lead Case)

TQ DELTA, LLC,

Plaintiff,

v.

**NOKIA CORP., NOKIA SOLUTIONS AND
NETWORKS OY, and NOKIA OF AMERICA
CORP.,**

Defendants.

CIV. A. NO. 2:21-CV-309-JRG
(Member Case)

NOKIA OF AMERICA CORP.,

Third-Party Plaintiff,

v.

**BROADCOM CORP., BROADCOM INC., and
AVAGO TECHNOLOGIES
INTERNATIONAL SALES PTE. LTD.,**

*Third-Party
Defendants.*

**DEFENDANTS' PRELIMINARY PROPOSED CONSTRUCTIONS AND
IDENTIFICATION OF EXTRINSIC EVIDENCE [PATENT RULE 4-2]**

Pursuant to the Docket Control Order (Dkt. No. 62) and Patent Rule 4-2, Defendants Nokia of America Corporation, Nokia Corporation, Nokia Solutions and Networks Oy (collectively, "Nokia"), and CommScope Holding Company, Inc., CommScope Inc., ARRIS US Holdings, Inc.,

ARRIS Solutions, Inc., ARRIS Technology, Inc., and ARRIS Enterprises, LLC (collectively, “CommScope”) (together, “Defendants”) hereby identify the following proposed constructions and extrinsic evidence.

In particular, Defendants herein identify preliminary proposed constructions of each claim term, phrase, or clause which the parties have collectively identified for claim construction purposes. Defendants also herein provide a preliminary identification of extrinsic evidence to support their proposed constructions.

I. Preliminary Statement and Reservation of Rights

The following preliminary proposed constructions do not waive any argument, such as, for example, that an Asserted Claim is indefinite or is otherwise invalid under one or more of 35 U.S.C. §§ 101, 102, 103, and/or 112, as detailed in Defendants’ Invalidity Contentions, and any supplements thereto. For example, Defendants reserve the right to argue that a particular claim term is indefinite and/or fails to satisfy the written description and enablement requirements, regardless of whether the term has been proposed for construction, has not been proposed for construction, and/or was initially proposed for construction but has since been dropped from the terms proposed for construction.

If TQ Delta modifies any assertion or contention in its Infringement Contentions, or presents any new assertion or contention relevant to these Preliminary Claim Constructions to the extent allowed by the Local Patent Rules or the Court, Defendants reserve the right to supplement or otherwise amend these Preliminary Claim Constructions. The Infringement Contentions are deficient in multiple respects and do not provide Defendants with sufficient information to understand the specific accused features and components and the alleged factual and evidentiary bases for TQ Delta’s infringement allegations. Among other things, the Infringement Contentions lack the specificity required by P.R. 3-1, fail to properly identify

accused instrumentalities, and fail to explain adequately Plaintiff's infringement theories for numerous limitations. TQ Delta has prejudiced Defendants' ability to understand, for purposes of preparing these Preliminary Claim Constructions, what TQ Delta alleges to be the scope of the Asserted Claims.

Defendants reserve the right to amend or otherwise supplement the preliminary proposed constructions that are provided herein, including after receiving additional discovery in this matter, and also in response to the preliminary proposed constructions that are being concurrently proposed in the Patent Rule 4-2 Disclosure of Plaintiff in this case.

II. Preliminary Claim Construction (P.R. 4-2(a))

Pursuant to Patent Rules 4-2(a) and 4-2(b), Defendants provide the attached **Appendix A**. Appendix A identifies claim terms, phrases, and clauses proposed for construction, including whether TQ Delta or Defendants proposed the term in their respective P.R. 4-1 statements. Identification of a term, phrase, or clause for construction applies equally to variations or other instances of that term, phrase, or clause in any of the asserted claims in the asserted patents, unless otherwise stated. Appendix A then identifies a list of exemplary claims within which the term, phrase, or clause is found.

The identified claims listed in this disclosure are representative. A construction of a term, phrase, or clause applies equally to variations or other instances of that term, phrase, or clause in any of the asserted claims in the asserted patents. Furthermore, to the extent a term, phrase, or clause renders a claim indefinite, all claims depending from that claim are similarly indefinite.

III. Identification of Extrinsic Evidence (P.R. 4-2(b))

Appendix A provides exemplary supporting evidence. Defendants reserve the right to amend or otherwise supplement their identification of supporting evidence that may be used to

support, describe, or explain Defendants' preliminary proposed claim constructions. Defendants further reserve the right to identify additional supporting evidence to offer in rebuttal to Plaintiff's proposed constructions, including expert testimony. Defendants further reserve the right to identify additional extrinsic evidence that is obtained through further discovery in this matter, including deposition testimony obtained from any third parties (such as named inventors and/or any expert witnesses).

Identification of a reference as supporting evidence is not an admission that the reference is "extrinsic," as opposed to "intrinsic," evidence. While it is not extrinsic evidence, Defendants may also rely on the file histories of the patents in suit and the file histories of any domestic or foreign related patents. Defendants may also rely on TQ Delta's Infringement Contentions and materials cited therein, and Defendants' Invalidity Contentions and materials cited therein. Further, Defendants may rely on any declarations, reports, or testimony by the named inventors or experts on behalf of TQ Delta in this case, other cases, or Patent Office proceedings, regarding the asserted technology. Defendants may also rely on any claim construction briefs, declarations, transcripts, orders, and memorandum opinions in any other case in which TQ Delta alleged infringement of one or more of the Asserted Patents.

Pursuant to Patent Rule 4-2(b), Defendants state that they may offer the testimony of one or more of the following expert witnesses: Bruce McNair, Dr. George Zimmerman, and/or Dr. Richard Wesel ("Experts"). Experts may be asked to offer their expert opinion in the form of expert declaration(s)—consistent with the requirements of Patent Rule 4-3—regarding how (or if) one of ordinary skill in the art at the time of the claimed inventions of the Asserted Claims would have understood certain claim terms proposed for construction, depending on whether such terms are, in fact, disputed following review of the parties' Patent Rule 4-2

Disclosures. Experts may also be asked to provide background and context regarding the technology at issue, including, but not limited to, the level of ordinary skill in the art, in an effort to assist the Court in understanding the technology in dispute from the perspective of one of ordinary skill at the relevant time. In providing any such background, Experts may rely on the extrinsic evidence identified in this document, as well as any other background material to explain the knowledge of a person of ordinary skill at the time. In opining about the meaning of disputed terms of the Asserted Claims, Experts may be asked to explain how Defendants' proposed constructions are supported by intrinsic evidence, extrinsic evidence, and/or the education and experience of a person of ordinary skill in the art relevant to the Asserted Patents.

Experts may also be asked to respond to TQ Delta's proposed constructions, supporting evidence, and arguments and evidence (including expert testimony) relied upon in TQ Delta's claim construction briefs. Experts may also be asked to provide opinions regarding indefiniteness of the asserted claims.

Defendants reserve the right to ask Experts to opine on any claim construction issue for which Plaintiff may provide expert testimony. Defendants further reserve the right to call Experts as live witnesses at the Claim Construction Hearing should Plaintiff request, and be permitted, to call any live witnesses at the Claim Construction Hearing.

IV. Availability to Meet and Confer (P.R. 4-2(c))

Pursuant to Patent Rule 4-2(c), Defendants will be available to "meet and confer for the purposes of narrowing the issues and finalizing preparation of a Joint Claim Construction and Prehearing Statement" in advance of the current due date for the parties' joint Patent Rule 4-3 filing.

Dated: March 3, 2022

Respectfully submitted,

/s/ M. Scott Stevens

M. Scott Stevens (NC Bar # 37828)
Karlee Wroblewski (NC Bar # 55043)
Nic Marais (NC Bar # 53533)
ALSTON & BIRD LLP
One South at the Plaza
101 South Tryon Street, Suite 4000
Charlotte, North Carolina 28280
Tel: 704.444.1000
Fax: 704.444.1111
Email: scott.stevens@alston.com
Email: karlee.wroblewski@alston.com
Email: nic.marais@alston.com

John D. Haynes (GA Bar # 340599)
Michael Deane (GA Bar # 498195)
ALSTON & BIRD LLP
One Atlantic Center
1201 West Peachtree Street
Suite 4900
Atlanta, GA 30309
Tel: 404.881.7737
Fax: 404.881.7777
Email: john.haynes@alston.com
Email: michael.deane@alston.com

Darlana Subashi (NY Bar # 5780747)
ALSTON & BIRD LLP
90 Park Avenue
New York, NY 10016
Tel: 212-210-9400
Fax: 212-210-9444
Email: darlena.subashi@alston.com

Adam Ahnhut (TX Bar # 24106983)
ALSTON & BIRD LLP
Chase Tower
2200 Ross Avenue, Suite 2300
Dallas, TX 75201
Email: adam.ahnhut@alston.com
Tel: 214.922.3400
Fax: 214.922.3899

*Counsel for Defendants
Nokia Corporation, Nokia Solutions
and Networks Oy, and Nokia
of America Corporation and Third-Party
Plaintiff, Nokia of America Corporation*

By: /s/ Andrew Ong
Eric H. Findlay (TX Bar No. 00789886)
Brian Craft (TX Bar No. 04972020)
FINDLAY CRAFT, P.C.
102 N. College Ave, Ste. 900
Tyler, TX 75702
Tel: 903.534.1100
Fax: 903.534.1137
Email: efindlay@findlaycraft.com
Email: bcraft@findlaycraft.com

Douglas J. Kline
Christie Larochelle
GOODWIN PROCTER LLP
100 Northern Avenue
Boston, MA 02210
Tel: 617.570.1000
Fax: 617.523.1231
Email: dkline@goodwinlaw.com
Email: clarochelle@goodwinlaw.com

Brett Schuman
Rachel M. Walsh
GOODWIN PROCTER LLP
Three Embarcadero Center, 28th Floor
San Francisco, CA 94111
Tel: 415.733.6000
Fax: 415.677.9041
Email: bschuman@goodwinlaw.com
Email: rwalsh@goodwinlaw.com

Andrew Ong
GOODWIN PROCTER LLP
601 Marshall St.
Redwood City, CA 94063
Tel: 650.752.3100
Fax: 650.853.1038
Email: aong@goodwinlaw.com

Attorney for Defendants CommScope Holding Company, Inc., CommScope Inc., ARRIS US Holdings, Inc., ARRIS Solutions, Inc., ARRIS Technology, Inc., and ARRIS Enterprises, LLC

CERTIFICATE OF SERVICE

I hereby certify that the foregoing document was served electronically on March 3, 2022,
on all counsel who have consented to electronic service.

/s/ M. Scott Stevens

M. Scott Stevens

APPENDIX A**I. Family 1**

Claim Term	Patent and Claim(s)	Proposed By	Proposed Construction	Extrinsic Evidence¹
transceiver	'686 Patent, Claims 17, 36, 40	Defendants	P&O, which is “communications device capable transmitting receiving data” of and	1998 & 2004 Merriam-Webster Dictionary definition of “transceiver”: a radio transmitter-receiver that uses many of the same components for both transmission and reception 2002 McGraw-Hill Dictionary of Scientific and Technical Terms definition of “transceiver”: A radio transmitter and receiver combined in one unit and having switching arrangements such as to permit both transmitting and receiving U.S. Patent No. 7,844,882 at 5:33-57

¹ As noted above, Defendants also intend to rely on testimony from experts as identified above in addition to the references listed explicitly in this column.

				ITU-T G.993.2 VDSL2 Standard ITU-T G.992.1 ADSL Standard
DMT symbol	'686 Patent, Claims 17, 36, 40	Defendants	P&O meaning	ITU-T G.993.2 VDSL2 Standard
each bit in the diagnostic message is mapped to [at least one / one] DMT symbol	'686 Patent, Claims 17, 36, 40	Defendants	Indefinite	2002 McGraw-Hill Dictionary of Scientific and Technical Terms definition of "map": 2002 McGraw-Hill Dictionary of Scientific and Technical Terms definition of "map": An output produced by an assembler, compiler, linkage editor, or relocatable loader which indicates the (absolute or relocatable) locations of such elements as programs, subroutines, variables, or arrays. 2002 McGraw-Hill Dictionary of Scientific

				<p>and Technical Terms definition of “map”: Preparation of a map or engaging in a mapping operation. 1. Any function or multiple-valued relation.</p> <p>Wikipedia.com definition of “map”: This terminology is not completely fixed, as these terms are generally not formally defined, and can be considered to be jargon.</p> <p>Google definition of “mapped”: “associate (a group of elements or qualities) with an equivalent group, according to a particular formula or model”</p> <p>ITU-T G.993.2 VDSL2 Standard</p> <p>ITU-T G.992.1 ADSL Standard</p>
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frequency domain received idle channel noise information	'686 Patent, Claims 17, 36, 40	Defendants	Indefinite	
array representing frequency domain received idle channel noise information	'686 Patent, Claims 17, 36, 40	Plaintiff	If “frequency domain received idle channel noise information” is not indefinite, then “array of values representative of noise in the frequency domain that was received by a transceiver on respective subchannels in the absence of a transmission signal”	

II. Family 2

Claim Term	Patent(s) and Claim(s)	Proposed By	Proposed Construction	Extrinsic Evidence
transceiver	'881 Patent, Claims 17, 18, 21, 23, 25, 26, 29, 31, 33, and 37 '193 Patent, Claims 1, 9, 10, 11, 12, 13 '601 Patent, Claims 8, 9, 13, 14, 15, 16, 17, 18, 21 '014 Patent, Claims 1, 3	Defendants	P&O, which is “communications device capable of transmitting and receiving data”	Extrinsic Evidence: See Family 1
plurality of bonded transceivers	'881 Patent, Claims 17, 18, 21, 23, 25, 26, 29, 31, 33, 37	Defendants	two or more transceivers, located on the same side of two or more physical links and each corresponding to one of the physical links, coordinated to transmit or receive a different portion of the same bit stream via a different one of the physical links	
operable to	'193 Patent, Claim 13 '601 Patent, Claims 8, 14, 21 '014 Patent, Claim 1	Defendants	Plain and ordinary meaning, not mere capability	

reduce a difference in latency between the bonded transceivers	'881 Patent, Claims 17, 25, 26, 29, 31, 33, 37	Defendants	Indefinite, or, if not indefinite, "minimize the difference in the configuration latencies between the bonded transceivers"	'706 Patent File History – Office Action dated 1/10/2011; Amdmt and Response Dated 2/11/2011. '511 Patent File History – Office Action dated 2/15/2011; Amdmt and Resp. dated 8/11/2011; Office Action dated Nov. 18, 2011; Amdmt dated May 14, 2012
each bonded transceiver utilizing at least one transmission parameter value to reduce a difference in latency between the bonded transceivers	'881 Patent, Claims 17, 25, 26, 29, 31, 33, 37	Defendants	Indefinite, or, if not indefinite, "each bonded transceiver configured with at least one transmission parameter value to minimize the difference in the configuration latencies between the bonded transceivers"	'706 Patent File History – Office Action dated 1/10/2011; Amdmt and Response Dated 2/11/2011. '511 Patent File History – Office Action dated 2/15/2011; Amdmt and Resp. dated 8/11/2011; Office Action dated Nov. 18, 2011; Amdmt dated May 14, 2012
utilize at least one transmission parameter value, for each transceiver in a plurality of bonded	'881 Patent, Claims 33, 37	Defendants	Indefinite, or, if not indefinite, "configure at least one transmission parameter value of each bonded transceiver to	'706 Patent File History – Office Action dated 1/10/2011; Amdmt and Response Dated 2/11/2011.

transceivers, to reduce a difference in latency between the bonded transceivers			minimize the difference in the configuration latencies between the bonded transceivers”	’511 Patent File History – Office Action dated 2/15/2011; Amdmt and Resp. dated 8/11/2011; Office Action dated Nov. 18, 2011; Amdmt dated May 14, 2012
utilize at least one parameter associated with operation of at least one of the first and second transceivers to reduce a difference in latency between the first and second transceivers	’193 Patent, Claim 13 ’601 Patent, Claims 14, 21	Defendants	Indefinite	’706 Patent File History – Office Action dated 1/10/2011; Amdmt and Response Dated 2/11/2011. ’511 Patent File History – Office Action dated 2/15/2011; Amdmt and Resp. dated 8/11/2011; Office Action dated Nov. 18, 2011; Amdmt dated May 14, 2012

III. Family 3

Claim Term	Patent(s) and Claim(s)	Proposed By	Proposed Construction	Extrinsic Evidence
transceiver	'882 Patent, Claims 9, 13 '048 Patent, Claims 1, 5 '5473 Patent, Claims 10, 28 '608 Patent, Claims 1, 2, 3, 4 '510 Patent, Claims 21, 22	Defendants	Plain and ordinary meaning, which is “communications device capable of transmitting and receiving data”	See Family 1
shared memory / sharing the memory / operable to be shared / sharing	'882 Patent, Claims 9, 13 '048 Patent, Claims 1, 5 '5473 Patent, Claims 10 '510 Patent, Claims 21, 22 '608 Patent, Claim 2	Plaintiff and Defendants	Plain and ordinary meaning	U.S. Patent No. 9,547,608

wherein the generated message indicates how the memory has been allocated between the [first deinterleaving / interleaving] function and the [second] deinterleaving function” / “a message indicating how the shared memory is to be used by the interleaver or the deinterleaver	'5473 Patent, Claims 10, 28	Defendants	Plain and ordinary meaning, which is that the message indicates the amount of memory [that has been allocated to / is to be used by] the [first deinterleaving / interleaving] function and the amount of memory [that has been allocated to / is to be used by] the [second] deinterleaving function	
operable to	'608 Patent, Claims 1, 4 '510 Patent, Claim 21, 22	Defendants	Plain and ordinary meaning, not mere capability	
specifying a maximum number of bytes of memory that are available to be allocated to [a/an interleaver/deinterleaver]	'882 Patent, Claims 9, 13 '048 Patent, Claims 1, 5	Defendants	Plain and ordinary meaning	

IV. Family 4

Claim Term	Patent and Claim(s)	Proposed By	Proposed Construction	Extrinsic Evidence
transceiver	'008 Patent, Claim 14	Defendants	Plain and ordinary meaning, which is "communications device capable of transmitting and receiving data"	Extrinsic Evidence: See Family 1
substantially scramble the phase characteristics of the plurality of carrier signals	'008 Patent, Claim 14	Plaintiff	Plain and ordinary meaning	
multiple carrier signals corresponding to the scrambled carrier signals are used by the first multicarrier transceiver to modulate the same bit value (identified by Defendants) / same bit value (identified by Plaintiff)	'008 Patent, Claim 14	Defendants and Plaintiff	Indefinite	
computing a phase shift for each carrier signal	'008 Patent, Claim 14	Defendants	computing the amount by which a phase is adjusted for each carrier signal	
combining the phase shift computed for each respective carrier signal with the phase characteristic of that carrier signal	'008 Patent, Claim 14	Defendants	adjusting the phase of each carrier signal by an amount computed for that carrier signal	

V. Family 6

Claim Term	Patent(s) and Claim(s)	Proposed By	Proposed Construction	Extrinsic Evidence
transceiver	'835 Patent, Claims 8, 24 '112 Patent, Claims 8, 10, 11, 12, 14	Defendants	Plain and ordinary meaning, which is “communications device capable of transmitting and receiving data”	Extrinsic Evidence: See Family 1
FIP setting	'835 Patent, Claims 8, 10, 24, 26 '112 Patent, Claim 8	Defendants	forward error correction and interleaver parameters characterized by the set of parameters for codeword size in bytes, number of information bytes in a codeword, number of parity or redundancy bytes in a codeword, and interleaver depth in number of codewords	ITU-T G992.3 Standard
FIP value	'835 Patent, Claims 8, 24	Defendants	numerical value of codeword size in bytes, number of information bytes in a codeword, number of parity or redundancy bytes in a codeword, or interleaver depth in number of codewords	ITU-T G992.3 Standard
flag signal	'835 Patent, Claims 8, 24 '162 Patent, Claims 8, 9	Defendants and Plaintiff	signal used to indicate when updated FIP settings are to be used	

interleaver parameter value	'835 Patent, Claims 10, 26 '162 Patent, Claim 8	Defendants	the numerical value of the interleaver depth in number of codewords	
operable to	'112 Patent, Claim 8	Defendants	Plain and ordinary meaning, not mere capability	
configured to	'162 Patent, Claim 8	Defendants	Plain and ordinary meaning, not mere capability	
steady-state communication	'112 Patent, Claim 8 '835 Patent, Claim 8 and 24	Plaintiff	the state of the transceiver reached after all initialization and training is completed in which user data is transmitted or received	

VI. Family 9

Claim Term	Patent(s) and Claim(s)	Proposed By	Proposed Construction	Extrinsic Evidence
transceiver	'411 Patent, Claims 10, 11, 17, 18, 19, 25 '577 Patent, Claims 16, 17, 30, 31, 37, 38, 53, 54 '348 Patent, Claims 1, 3, 9, 11 '055 Patent, Claims 11, 17, 19 '4473 Patent, Claims 1, 3 '809 Patent, Claims 1, 3, 4, 6, 8, 10, 11, 13, 15, 17, 18, 20, 22, 24, 25, 27	Defendants	Plain and ordinary meaning, which is “communications device capable of transmitting and receiving data”	See Family 1
operable to	'577 Patent, Claims 16, 17, 30, 31, 38, 53, 54 '348 Patent, Claims 1, 3, 9, 11 '055 Patent, Claim 11 '4473 Patent, Claims 1, 3	Defendants	Plain and ordinary meaning, not mere capability	

PTM-TC [(Packet Transfer Mode-Transmission Convergence)] codewords	'577 Patent, Claims 16, 37 '348 Patent, Claims 1, 9 '055 Patent, Claim 17	Defendants	Indefinite	ITU-T G.993.1 VDSL1 Standard ITU-T G.993.2 VDSL2 Standard
wherein the transceiver is operable to receive at least one retransmitted packet using interleaving	'577 Patent, Claims 17, 31	Defendants	Indefinite	ITU-T G.993.1 VDSL1 Standard ITU-T G.993.2 VDSL2 Standard
DMT symbol	'348 Patent, Claims 1, 9 '4473 Patent, Claim 1 '809 Patent, Claims 1, 8, 15, 22	Defendants	Plain and ordinary meaning	
wherein the instructions further cause the transceiver to retransmit the packet using forward error correction decoding and deinterleaving.	'809 Patent, Claim 24	Defendants	Indefinite	ITU-T G.993.1 VDSL1 Standard ITU-T G.993.2 VDSL2 Standard
memory has been allocated	'411 Patent, Claim 10	Defendants	Plain and ordinary meaning	
[transmit / transmitting / retransmit / retransmitting / receive / receiving] [by the	'577 Patent, Claims 16, 30, 37, 38, 53, 54 '348 Patent, Claims 1, 3, 9,	Defendants	Indefinite	ITU-T G.993.1 VDSL1 Standard

transceiver] [at least one packet / a packet / the packet / a retransmitted packet / a message / a plurality of messages / at least one message] using [interleaving / deinterleaving / (a/the) forward error correction encoder / (a/the) forward correction decoder / forward correction encoding / forward correction decoding] [and (an/the) interleaver / and (a/the) deinterleaver / and interleaving / and deinterleaving]	11 '4473 Patent, Claims 1, 3 '809 Patent, Claims 1, 3, 8, 10, 15, 17, 22, 24			ITU-T G.993.2 VDSL2 Standard
higher immunity to noise	'348 Patent, Claims 2 and 9 '809 Patent, Claims 1, 9, 16, 23	Plaintiff	Plain and ordinary meaning	

VII. Family 10

Claim Term	Patent(s) and Claim(s)	Proposed By	Proposed Construction	Extrinsic Evidence
receive a first plurality of bits on the first plurality of carriers using a first SNR margin; receive a second plurality of bits on the second plurality of carriers using a second SNR margin	'354 Patent, Claim 10	Defendants	Indefinite (§ 112 ¶ 2)	
A multicarrier communications transceiver operable to receive a multicarrier symbol comprising a first plurality of carriers	'354 Patent, Claim 10	Defendants	Indefinite (§ 112 ¶ 2)	
wherein the first SNR margin provides more robust reception than the second SNR margin	'354 Patent, Claim 10	Defendants	Indefinite (§ 112 ¶ 2)	
operable to demodulate for reception a first plurality of bits from a first carrier	'988 Patent, Claim 16	Defendants	Indefinite (§ 112 ¶ 2)	
operable to	'354 Patent, Claim 10 '988 Patent, Claim 16	Defendants	Plain and ordinary meaning, not mere capability	
transceiver	'354 Patent, Claim 10 '988 Patent, Claim 16	Defendants	Plain and ordinary meaning, which is “communications device capable of transmitting and receiving	Extrinsic Evidence: See Family 1

			data”	
Signal to Noise Ratio (SNR) Margin; SNR Margin	<p>’354 Patent, Claims 10, 11, 12</p> <p>’988 Patent, Claim 16</p>	Defendants	<p>“a parameter used in determining the number of bits allocated to each of a plurality of carriers, where the value of the parameter specifies an extra SNR requirement assigned per carrier in addition to the SNR required to maintain a specified bit error rate (BER) for the communication link at a specified bit allocation”</p>	